*Arthropoda Selecta 11 (4): 259–264

The millipede *Vaulogerodesmus pictus* (Brölemann, 1916) rediscovered, with a review of this Southeast Asian genus (Diplopoda: Polydesmida: Paradoxosomatidae)

Диплопода *Vaulogerodesmus pictus* (Brölemann, 1916) обнаружена вновь, с обзором этого рода из Юго-Восточной Азии (Diplopoda: Polydesmida: Paradoxosomatidae)

Sergei Golovatch*, Jolanta Wytwer and Wojciech Jędryczkowski*****
С.И. Головач*, И. Витвер, В. Ендрычковский*****

*Institute for Problems of Ecology and Evolution, Russian Academy of Sciences, Leninsky pr. 33, Moscow 119071 Russia; e-mail: sgol@orc.ru
**Museum and Institute of Zoology, Polish Academy of Sciences, Wilcza 64, 00-679 Warszawa, Poland; e-mail: jolawyt@robal.miiz.waw.pl
*** Faculty of Ecology, University of Ecology and Management, ul.Wawelska 14, 02-061 Warszawa, Poland; e-mail: wjedrycz@wa.onet.pl
* Институт проблем экологии и эволюции РАН, Ленинский проспект, 33, Москва 119071 Россия.

KEY WORDS: Diplopoda, Paradoxosomatidae, *Vaulogerodesmus*, taxonomy, key, Southeast Asia.

КЛЮЧЕВЫЕ СЛОВА: Diplopoda, Paradoxosomatidae, *Vaulogerodesmus*, таксономия, ключ, Юго-Восточная Азия.

ABSTRACT: The Southeast Asian millipede genus *Vaulogerodesmus* Brölemann, 1916 is briefly reviewed, and an illustrated key provided to all of its five currently described species, on the occasion of a recent rediscovery of its type species, *V. pictus* Brölemann, 1916, at Tam Dao, Vinh Phu Province, northern Vietnam.

РЕЗЮМЕ: Даются краткий обзор диплопод рода *Vaulogerodesmus* Brölemann, 1916 из Юго-Восточной Азии и иллюстрированный ключ для всех пяти описанных пока видов рода в связи с недавним повторным обнаружением его типового вида *V. pictus* Brölemann, 1916 в Там-Дао (провинция Винь-Фу, Северный Вьетнам).

Introduction

The millipede genus *Vaulogerodesmus* Brölemann, 1916 has hitherto been known to comprise the following five species: *V. pictus* Brölemann, 1916 (the type-species), from ”Tonkin” (= North Vietnam) [Brölemann, 1916], *V. dawydoffiae* (Attems, 1953), from Lang Biang Peak, 2200 m altitude, central part of South Vietnam [Attems, 1953; revised by Hoffman, 1973], *V. mahunkai* Korsós & Golovatch, 1989, from Tam Dao, Vinh Phu Province, and Cuc Phuong, Ninh Bing Province, North Vietnam [Korsós & Golovatch, 1989], *V. beroni* Golovatch, 1995, from Zijin (Purple) Mountain, 350–450 m altitude, environs of Nanjing, southeastern China, and *V. picturatus* Golovatch, 1995, from Guilin, Zhuangxi County, Guanxi Province, southeastern China [Golovatch, 1995]. Among these species, *V. pictus*, however nicely described [Brölemann, 1916], has heretofore remained the sole congener without exact provenance of material. In addition, Brölemann’s [1916] samples must have been somewhat faded, as he misleadingly described the coloration as pale yellow with brown blackish markings. As fresh material shows, however, this impression is not entirely correct.

No key to the known species of *Vaulogerodesmus* has ever been compiled. As fresh material of *V. pictus* has recently become available for study, the opportunity is taken here not only to provide the first exact locality for this remarkable taxon but also to briefly review this small genus and to present an illustrated key to all of its constituent species.

Printed in 2003.

Taxonomy

Vaulogerodesmus Brölemann, 1916

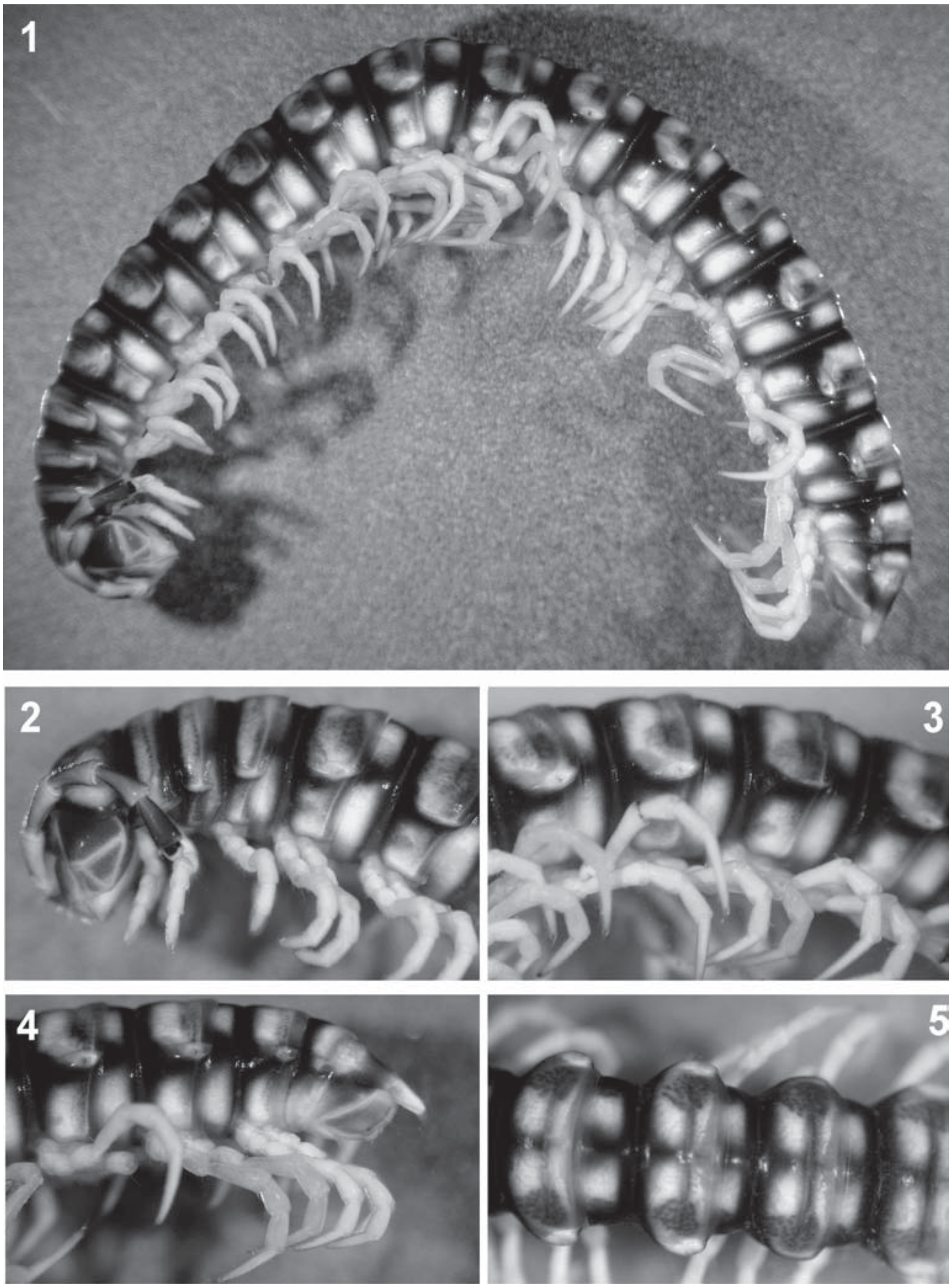
Type species: *Vaulogerodesmus pictus* Brölemann, 1916, by original designation and monotypy.

DIAGNOSIS. A genus of Nedyopini with gonopod telopodite relatively modestly expanded dorsally and devoid of a distinct suture setting off a postfemoral portion.

REMARKS. Attems [1937] synonymized *Vaulogerodesmus* under *Nedyopus* Attems, 1914, but, following both Jeekel [1968] and Hoffman [1973], we consider both these genera sufficiently distinct. However, if with further progress in the knowledge of Southeast and East Asian Nedyopini some forms emerge that prove transitional between *Vaulogerodesmus* and *Nedyopus*, that is, with more strongly expanded gonotelopodites showing at least some traces of a postfemoral sulcus, then it is the latter generic name that should persist as valid.

Vaulogerodesmus pictus Brölemann, 1916
Figs 1–9.

Material. 3♂♂ (Museum & Institute of Zoology PAS (MIIZ), Warsaw, Poland), 1 ♂ (Zoological Museum of the Moscow State

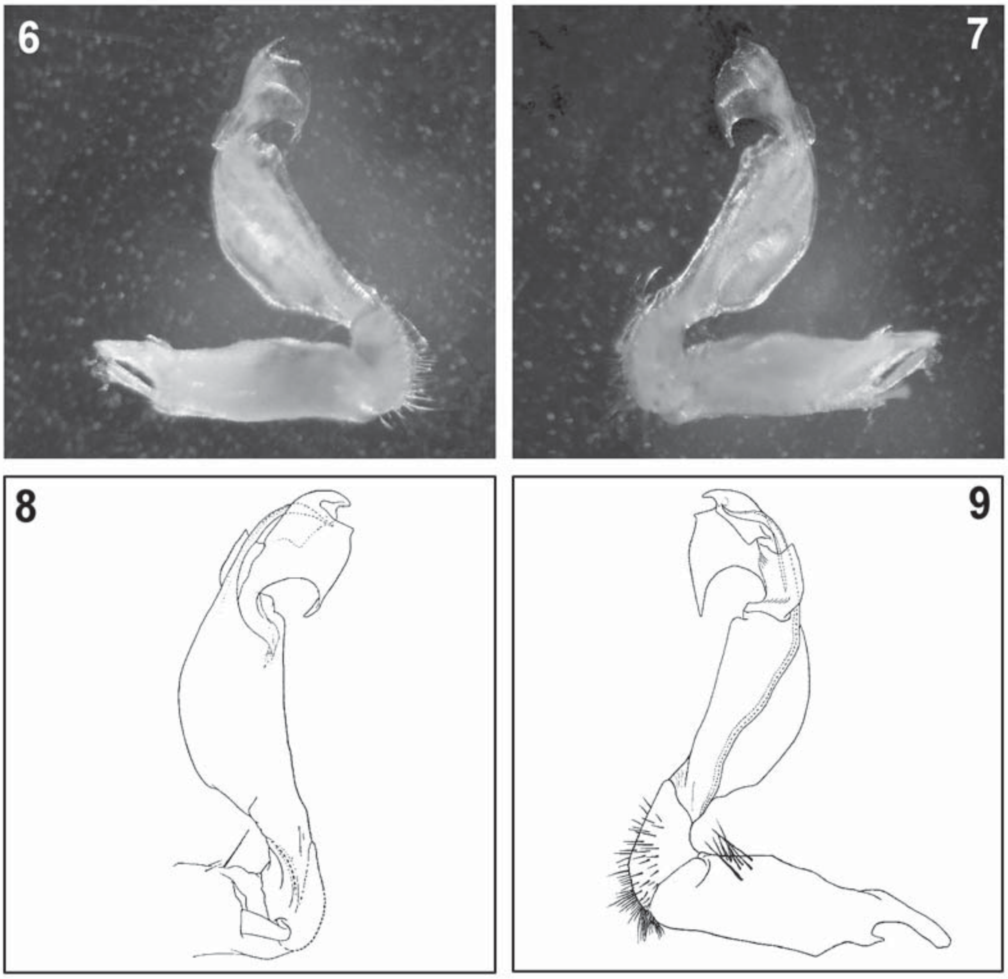


Figs 1–5. *Vaulogerodesmus pictus* Brölemann, 1916, ♂ from Tam Dao. 1 — habitus and colour pattern, lateral view; 2 — anterior body portion, lateral view; 3 — body segments 10–13: lateral view; 4 — caudal body portion, lateral view; 5 — body segments 9–11, dorsal view.

Рис. 1–5. *Vaulogerodesmus pictus* Brölemann, 1916, ♂ из Там-Дао. 1 — общий вид и расцветка, вид сбоку; 2 — передняя часть тела, вид сбоку; 3 — туловищные сегменты 10–13, вид сбоку; 4 — задняя часть туловища, вид сбоку; 5 — туловищные сегменты 9–11, вид сверху.

University, Russia), Vietnam, Vinh Phu Prov., Tam Dao, subtropical rainforest, ca. 1000 m a.s.l., at waterfall, stump, 06.02.2001. — 1 ♂ (MIIZ), same locality, subtropical rainforest, ca. 900 m a.s.l., stump, 10.02.2001, all leg. W. Jędryczkowski.

REDESCRIPTION. Length of ♂♂ ca. 32 mm, width of midbody pro- and metazona 2.0–2.3 and 2.7–2.9 mm, respectively. Coloration variegate castaneous brown blackish to yellow, with a characteristic annulated pattern (Figs 1–5) of an incomplete (absent from posterior halves of metazona), vague, dark, axial line, a blackish region of stricture between pro- and metazona, paired marbled brownish spots dorsally at base of and anterolaterally on paraterga with contrastingly yellow to pale reddish yellow, paramedian spots on metazona, region below paraterga, labral region, venter and epiproct, and bright yellow to pallid tip of antenna, ozopore disc and



Figs 6–9. *Vaulogerodesmus pictus* Brölemann, 1916. 6 & 7, ♂ from Tam Dao — left gonopod, mesal and lateral views, respectively; 8 & 9 — left gonopod (after Brölemann [1916]), mesal and lateral views, respectively.

Рис. 6–9. *Vaulogerodesmus pictus* Brölemann, 1916. 6 и 7, ♂ из Там-Дао — правый гонопод, соответственно изнутри и сбоку; 8 и 9 — левый гонопод (по Brölemann [1916]), соответственно изнутри и сбоку.

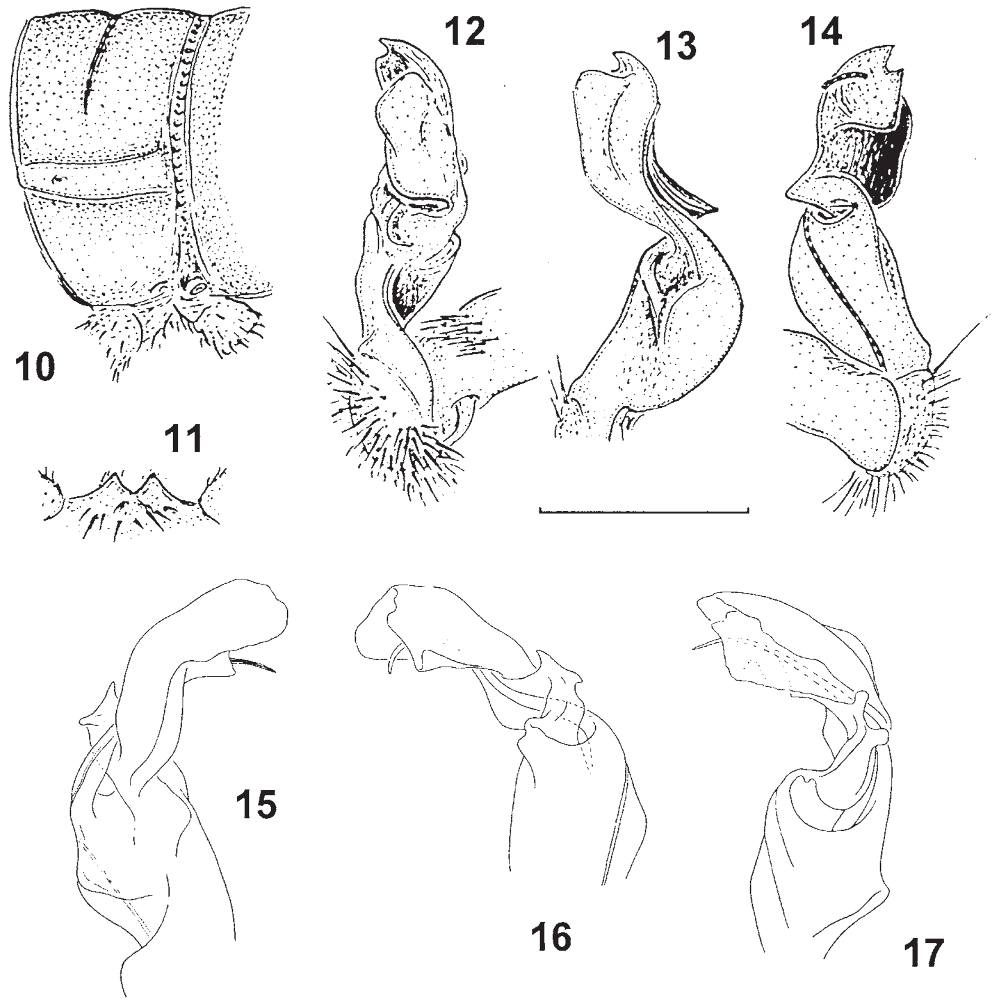
legs. Antennae infuscate, dark brown to blackish distad (Fig. 2). Head (except for labral region) also infuscate.

Head with a distinct epicranial suture, in width head = body segment 4 < collum = 3 < 2 < 5=16, onward body very gently and gradulally tapering. Antennae medium-sized, relatively slender, in situ reaching to midway of body segment 3 dorsally. Teguments smooth and shining, metatergal setation untraceable. Paraterga poorly developed (Fig. 5), set low, mostly at about ½ midbody height (Figs 2–4), all distincly margined dorsally, pore-bearing paraterga distinctly margined also ventrally; poreless paraterga much narrower than pore-bearing ones in lateral view, caudal corner always more or less angular and rounded (Fig. 5), only on body segment 2 subtriangular, relatively narrowly rounded and produced caudally slightly beyond rear tergal contour. Ozopores lateral, disc distinct, rounded. Stricture between pro- and metazona deep. evidently but rather finely striate. Transverse metatergal sulcus slightly sinuate in the middle, deep, beaded at bottom, far from reaching bases of paraterga, present on body segments 5–18. Pleurosternal carinae like very poorly developed subcaudal bulges on body segments 3–5, like small but evident, rounded, caudal lobules somewhat surpassing rear metasomital contour on body segments 6 and 7, onward totally wanting. Epiproct long, strongly flattened dorsoventrally, roundly subtrunctate and sometimes slightly emarginate at tip; pre-apical setigerous incisions/tubercles poorly developed, lying close to tip. Subanal scale semicircular, regularly rounded caudally, setigerous knobs small, inconspicuous, rather strongly separated.

Sterna unmodified, poorly setose, cross-impression weak; a paramedian pair of small, densely setose, roundish cones between coxae 4. Legs long, apparently somewhat incrassate, tarsal brushes present on pregonopodial legs only.

Gonopods (Figs 6–9) with a modestly inflated, elongate, suberect femorite, a totally missing suture demarcating a postfemoral region, and a characteristically subsecuriform lamina medialis.

REMARKS. The above description shows certain minor discrepancies with Brölemann's [1916] in respect of the coloration and the development of pleurotergal carinae. Based on the gonopod structure (cf. Figs 6–7 and 8–9), however, there can be no doubt concerning the identity of the



Figs 10–17. *Vaulogerodesmus* species. 10–14 — *V. beroni* Golovatch, 1995, 10 — metasomite 10, lateral view; 11 — sternal cones between ♂ coxae 4, ventrocaudal view; 12–14 — right gonopod, mesal, lateral, and ventral views, respectively (after Golovatch [1995]); 15–17 — *V. dawydoffiae* (Attems, 1953), right gonopod, mesal, lateral, and dorsolateral views, respectively (after Hoffman [1973]).

Рис. 10–17. Виды *Vaulogerodesmus*. 10–14 — *V. beroni* Golovatch, 1995, 10 — метасомит 10, вид сбоку; 11 — стернальные конусы между коксами 4 у ♂, вид снизу и сзади; 12–14 –правый гонопод, соответственно изнутри, сбоку и снизу (по Golovatch [1995]); 15–17 — *V. dawydoffiae* (Attems, 1953), правый гонопод, соответственно изнутри, сбоку и дорсолатерально (по Hoffman [1973]).

above samples. This is the first exact locality to be reported for this remarkable species. Interestingly, Tam Dao appears to support still another congener, *V. mahunkai*.

Vaulogerodesmus species appear to vary in size (1.7–5.0 mm wide), coloration, the degree of development and shape of the paraterga and pleurotergal carinae, the shape of the sternal tubercles between ? coxae 4, and gonopod conformation. Many more congeners than the known handful can readily be expected to occur in Southeast and East Asia, with the present review deemed to facilitate the task of their recognition and allocation.

Key to *Vaulogerodesmus* species:

1. Coloration relatively uniform, in alcohol pale gray-yellow-brown to dark castaneous brown; body width up to 1.8 (♂) or 2.2 mm (♀); paraterga especially poorly-developed, set low, even pore-bearing ones parallel-side (Fig. 10); tubercles between ♂ coxae 4 particularly low (Fig. 11); gonopod as in Figs 12–14; southeastern China .... *V. beroni*

— Colour pattern present, coloration contrastingly variegated; body width greater, at least 2.9 mm; paraterga normally better developed; tubercle(s) between ♂ coxae 4 higher; gonopod configuration different 2

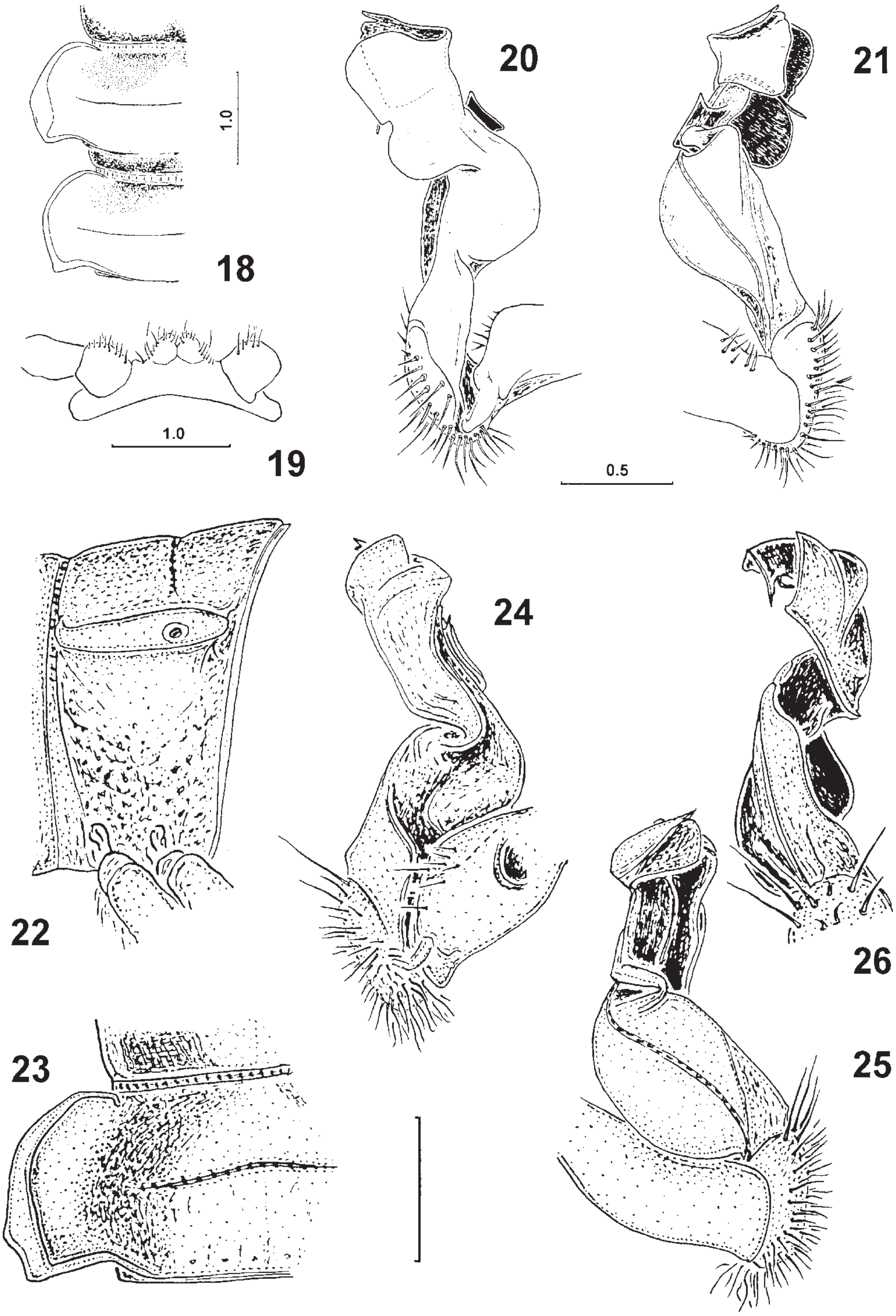
2. Paraterga almost like in *V. beroni* (Fig. 10), low and parallel-sided in lateral view, ozopore disc very small; one large but bifid process between ♂ coxae 4; gonopods like in Figs 15–17; central South Vietnam .... *V. dawydoffiae*

— Paraterga usually larger, if poorly developed then ozopore disc considerable (Fig. 3) and body width ca. 3.0 mm; two rounded cones between ♂ coxae 4 (Fig. 19); gonopods different 3

3. Paraterga small, always angular caudally, not protruding beyond rear tergal contour (Fig. 5); lamina medialis characteristically subsecuriform (Figs 6–9) .. *V. pictus*

— Paraterga considerable, some nearly pointed, beak-like caudally; gonopods different 4

4. Paraterga set lower, as in Fig. 18; metatergal sulcus starting from body segment 4 but fully developed only



Figs 18–26. *Vaulogerodesmus* species. 18–21 — *V. mahunkai* Korsós et Golovatch, 1989, 18 — left halves of body segments 7 and 8, dorsal view; 19 — sternal cones between ♂ coxae 4, front view; 20 & 21 — right gonopod, mesal and lateral views, respectively (after Korsós & Golovatch [1989]); 22–26 — *V. picturatus* Golovatch, 1995, 22 & 23 — left half of body segment 10, lateral and dorsal views, respectively; 24–26 — right gonopod, mesal, lateral, and ventral views, respectively (after Golovatch [1995]).

Рис. 18–26. Виды *Vaulogerodesmus*. 18–21 — *V. mahunkai* Korsós et Golovatch, 1989, 18 — правые половины туловищных сегментов 7 и 8, вид сверху; 19 — стернальные конусы между коксами 4 у ♂, вид спереди; 20 и 21 — правый гонопод, соответственно изнутри и сбоку (по Korsós & Golovatch [1989]); 22–26 — *V. picturatus* Golovatch, 1995, 22 и 23 — левая половина туловищного сегмента 10, соответственно сбоку и сверху; 24–26 — правый гонопод, соответственно изнутри, сбоку и снизу (по Golovatch [1995]).

from segment 5 on; gonopods as in Figs 20 & 21; North Vietnam .... *V. mahunkai*

— Paraterga set higher, as in Figs 22 & 23, metatergal sulcus starting from body segment 5 only; gonopods as in Figs 24–26; southeastern China .... *V. picturatus*

ACKNOWLEDGEMENTS: Both SG and JW are most grateful to the support rendered through the Polish-Russian interacademician cooperation programme. Special thanks of one of us (WJ) go to Dr. Nguyen Tri Tien, of the Institute of Ecology and Biological Resources, Hanoi, Vietnam for technical assistance.

References

Attems C. 1937. Myriapoda 3. Polydesmoidea I. Fam. Strongylosomidae // Das Tierreich. Lfg.68. S.i—xxii, 1—300.

Attems C. 1953. Myriopoden von Indochina. Expedition von Dr. C. Dawydoff (1938—1939) // Mém. Mus. natn. Hist. nat., Sér.A (Zool.). T.5. Fasc.3. P.133—230.

Brölemann H.W. 1916. Essai de classification des polydesmiens (Myriapodes) // Ann. Soc. ent. Fr. T.84. P.523—608.

Golovatch S.I. 1995. On several new or poorly-known Oriental Paradoxosomatidae (Diplopoda Polydesmida, III // Arthropoda Selecta. Vol.4. No.2. P.89—97.

Hoffman R.L. 1973. Descriptions and allocation of new or poorly-known genera and species of Paradoxosomatidae from southeastern Asia (Diplopoda: Polydesmida) // J. nat. Hist. Vol.7. P.361—389.

Jeekel C.A.W. 1968. On the classification and geographical distribution of the family Paradoxosomatidae (Diplopoda: Polydesmida). Rotterdam. i—vii, 162 pp.

Korsós Z. & Golovatch S.I. 1989. Addenda to the millipede fauna of Vietnam (Diplopoda) // Acta Zool. Hung. Vol.35. Nos 3—4. P.211—220.